

## CLAIMS

1. A power capacitor comprising at least one capacitor element (2a-2d) enclosed in a substantially cylindrical container (1, 22-22c) of a material that substantially comprises a first polymer material, and wherein the container (1, 22-22c) on its envelope surface comprises a plurality of protrusions (23-23e) designed to extend the creepage distance along the container, characterized in that the protrusions (23-23e) are substantially of a second polymer material, and that the protrusions are formed with respect to their thickness and radial length so that they cool the capacitor.
- 5 2. A power capacitor according to claim 1, characterized in that the protrusions (23-23e) comprise at least one protrusion (23c) with a thickness (t2) in the interval of 0.2-10 mm and a radial length (L2) in the interval of 5-50 mm.
- 10 3. A power capacitor according to claim 2, characterized in that the protrusions (23-23e) comprise at least one protrusion with a thickness (t2) in the interval of 1-4 mm and a radial length (L2) in the interval of 10-25 mm.
- 15 4. A power capacitor according to any of the preceding claims, characterized in that essentially the whole envelope surface of the power capacitor is covered with a plurality of the protrusions (23-23e).
- 20 5. A power capacitor according to claim 1, characterized in that the protrusions (23-23e) comprise a plurality of smaller protrusions (23c, 23d) with a thickness (t2) in the interval of 0.2-10 mm and a radial length (L2) in the interval of 5-30 mm, and that the small protrusions (23c, 23d) are arranged in the vicinity of at least one larger protrusion (23e) with a thickness (t3) in the interval of 2-10 mm and a radial length (L3) in the interval of 20-60 mm.
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6. A power capacitor according to claim 5, **characterized** in that the protrusions comprise a pattern with a plurality of smaller protrusions (23d) and at least one larger protrusion (23e), and that the pattern is repeated along essentially the whole envelope surface of the capacitor.

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7. A power capacitor according to claim 6, **characterized** in that 10-20 smaller protrusions (23d) are arranged in the vicinity of at least one larger protrusion (23e).

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8. A power capacitor according to any of the preceding claims, **characterized** in that the protrusions are arranged with an axial pitch (a2) in the interval of 5-25 mm.

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9. A power capacitor according to any of the preceding claims, **characterized** in that the capacitor element/s (2a-2d) is/are enclosed in at least one insulating medium (10, 21, 21a) which is in a state different from a liquid state within the working temperature interval of the capacitor.

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10. A power capacitor according to any of the preceding claims, **characterized** in that the first polymer material and the second polymer material are of the same kind of polymer materials.

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11. A power capacitor according to any of the preceding claims, **characterized** in that the insulating medium (10, 21, 21a), the container (1, 22-22c) and the protrusions (23-23e) of the container are all for the most part of rubber, preferably silicone rubber.

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12. A power capacitor according to claim 11, **characterized** in that the insulating medium (10, 21, 21a), the container (1, 22-22c) and the protrusions (23-23e) of the container are of the same kind of rubber.

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13. A power capacitor according to any of claims 1-10, **characterized** in that the insulating medium (10, 21, 21a),

the container (1, 22-22c) and the protrusions (23-23e) of the container are all for the most part of a thermoset.

14. A power capacitor according to claim 13, **characterized** in that the insulating medium (10, 21, 21a), the container (1, 22-22c) and the protrusions (23-23e) of the container are of the same kind of thermoset, and that the thermoset is based on one of the following materials: epoxy, polyurethane, polyester.

10 15. A power capacitor according to any of claims 11-14, **characterized** in that the insulating medium (10, 21), the container (1, 22-22c) and the protrusions (23-23e) of the container are injection-moulded in one single piece.

15 16. A power capacitor according to any of claims 1-9, **characterized** in that the container (1, 22a-22c) and the protrusions (23a-23e) of the container are of different polymer materials.

20 17. A power capacitor according to claim 16, **characterized** in that the container (1, 22a-22c) is of polyethylene and the protrusions (23a-23e) are of silicone rubber or EPDM.

25 18. A power capacitor according to claim 16, **characterized** in that the container (1, 22a-22c) is of fibre-reinforced thermoset and the protrusions (23a-23e) are of silicone rubber or EPDM.

30 19. A power capacitor according to any of claims 16-18, **characterized** in that the insulating medium (10, 21, 21a) is silicone in gel state.

35 20. A power capacitor according to any of claims 16-18, **characterized** in that the insulating medium (10, 21, 21a) is based on a thermoset.

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21. A power capacitor according to any of the preceding claims, characterized in that the capacitor comprises at least one tubular element (20) running in the cylinder direction and extending through each capacitor element (2a-2d).

5 22. A power capacitor according to claim 21, characterized in that the tubular element (20) is reinforced by armouring the tubular element.

10 23. A power capacitor according to any of the preceding claims, characterized in that the container (1, 22a-22c) is reinforced by armouring the container.

15 24. A power capacitor according to any of the preceding claims, characterized in that a diffusion layer is arranged on at least the inside of the container (1, 22a-22c).

20 25. A method for manufacturing a power capacitor comprising at least one capacitor element (2a-2d) enclosed in a substantially cylindrical container (1, 22a-22c) made of a material that substantially comprises a first polymer material, and wherein the container (1, 22a-22c) on its envelope surface comprises a plurality of protrusions (23-23e) designed so as to extend the creepage distance along the container, characterized in that the protrusions (23-23e) are made of a second polymer material, that the protrusions (23-23e) are formed with respect to their length and width so that they cool the capacitor, and that the capacitor element/s is/are encapsulated in a container (1, 22a-22c).

25 30 26. A method according to claim 25, characterized in that the capacitor element/s (2a-2d) is/are brought to be enclosed in at least one insulating medium which is in state other than liquid state within the working temperature interval of the capacitor.

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27. A method according to claim 26, characterized in that the manufacture of the container, the application of the protrusions, the encapsulation of the capacitor element/s and the enclosure in the insulating medium are achieved by 5 injection moulding.

28. A method according to claim 27, characterized in that the material is rubber, preferably silicone rubber.

10 29. A method according to claim 27 or 28, characterized in that the injection moulding occurs in one single step and with one single material.

15 30. A method according to claim 27 or 28, characterized in that the injection moulding occurs in two steps, whereby in a first step the capacitor element/s (2a-2d) is/are enclosed in the insulating medium and in a second step the container (1, 22-22c) is manufactured, and the protrusions (23a-23e) are applied, and wherein in the first step a polymer 20 material is used as material which has lower viscosity than the polymer material that is used in the second step.

25 31. A method according to claim 25, characterized in that a cylindrical polymer tube is provided for forming the container (1, 22-22c), that the protrusions (23a-23e) are applied to the polymer tube, whereby the tube is preferably of polyethylene, and that the capacitor element/s (2a-2d) is/are placed in the polymer tube.

30 32. A method according to any of claims 27-31, characterized in that each capacitor element (2a-2d) prior to injection moulding is applied to a tubular element (20) extending through each capacitor element.

35 33. A method according to of claim 32, characterized in that the tubular element (20) is reinforced by armouring.

34. A method according to any of claims 31-33, **characterized** in that the protrusions (23a-23e) are applied to the container (1, 22a-22c) by injection moulding, by winding them in a spiral around the container, or by providing them as prefabricated sleeve-like elements which are threaded onto the container.

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35. A method according to any of the preceding claims, **characterized** in that the container (1, 22-22c) is reinforced by armouring.

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36. A method according to any of the preceding claims, **characterized** in that a diffusion layer is applied to at least the inside of the container (1, 22-22c).

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37. A method according to claim 34, **characterized** in that at least the outside of the container (1, 22-22c) is coated with silicone before the protrusions are applied.

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38. A method according to claim 31, **characterized** in that the protrusions are applied to the container (1, 22-22c) by injection moulding and that the container is surface-modified prior to the injection moulding.

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39. A method according to any of claims 31-38, **characterized** in that a mechanical support is applied for the container prior to the injection moulding.

40. Use of a power capacitor according to any of claims 1-24 at voltages exceeding 1 kV, preferably at least 5 kV.

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41. Use of a power capacitor according to any of claims 1-24 in a system for transmission of alternating current (AC).